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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/658,696	09/08/2000	Sung Bae Moon	C34037/119442	3637

7590 06/16/2004

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EXAMINER	
HAN, CLEMENCE S	

ART UNIT	PAPER NUMBER
2665	

DATE MAILED: 06/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No.	Applicant(s)	
	09/658,696	MOON, SUNG BAE	
	Examiner	Art Unit	
	Clemence Han	2665	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *3/25/2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7,9,10,12 and 14* is/are rejected.

7)☒ Claim(s) *8, 11 and 13* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Responsive to amendment received on March 25, 2004, amended claims 3 and 5 are entered.

Double Patenting

2. Applicant is advised that should claim 5 be found allowable, claim 14 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 103

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claim 1, 2, 5–7, 9, 10, 12 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Xin et al. (U.S. Patent 6,268,818) in view of Antonio et al. (U.S. Patent 6,519,456).

In regarding to claim 1, Xin teaches an RF transmitting device 800 having a baseband signal on I/Q channels 801, 802 and a transmitting antenna, said RF

transmitting device comprising: a digital unit for digital modulating the baseband signal on the I/Q channel (Column 11 Line 49 – 52), and then converting the digital modulated signal into an analog signal 814; an analog frequency up-converting unit for primarily up-converting 818 the analog-converted signal in the digital unit into an IF signal and a secondary up-converting 824 the converted IF signal into an RF signal; and a transmitting unit for amplifying the secondarily up-converted RF signal to an arbitrary transmitting output level and transmitting the amplified signal via the transmitting antenna (Column 11 Line 46 – 47). Xin, however, does not teach modulating baseband signals by each frequency assignment provide from the channel cards. Antonio teaches modulating baseband signals by each frequency assignment provide from the channel cards (Column 19 Line 35 – Column 20 Line 16, Figure 14C). It would have been obvious to one skilled in the art to modify Xin to include modulating baseband signals by each frequency assignment provide from the channel cards as taught by Antonio in order to increase the capacity of a cell in a CDMA system (Column 1 Line 42–50).

In regarding to claim 2, Xin teaches a digital modulators for executing a QPSK modulation (Figure 8) and a D/A converter 814 for converting QPSK modulated signal into an analog signal to thereby output the converted analog signal to said analog frequency up-converting unit (Figure 8). Xin, however, does

not teach modulating baseband signals by each frequency assignment provide from the channel cards. Antonio teaches modulating baseband signals by each frequency assignment provide from the channel cards (Column 19 Line 35 – Column 20 Line 16, Figure 14C). It would have been obvious to one skilled in the art to modify Xin to include modulating baseband signals by each frequency assignment provide from the channel cards as taught by Antonio in order to increase the capacity of a cell in a CDMA system (Column 1 Line 42–50).

In regarding to claim 5, Antonio teaches the serially coupled outputs from the modulators outputted to the D/A converter (Figure 13).

In regarding to claim 6, Xin teaches the analog frequency up-converting unit comprises: a first frequency up-converter 818, 820 for up-converting the coupled multi-frequency assignment analog signal outputted from said digital unit into an arbitrary IF signal; a band-pass filter 822 for band-pass filtering the coupled multi-frequency assignment IF signal outputted from said first frequency up-converter 818, 820 to an arbitrary frequency bandwidth; and a second frequency up-converter 824, 826 for converting the IF signal filtered in said band-pass filter 822 into an RF signal to thereby output the converted RF signal to said transmitting unit.

In regarding to claim 7, Xin teaches the first frequency up-converter comprises: a first local oscillator 820 for generating a fixed local frequency to convert the analog signal inputted into the IF signal; and a first mixer 818 for mixing the fixed local frequency signal generated from said first local oscillator and the analog signal inputted and converting the mixed result into the IF signal having a constant center frequency of the multi-frequency assignment band.

In regarding to claim 9, Xin teaches the second frequency up-converter comprises: a second local oscillator 826 for generating a fixed local frequency to convert the filtered IF signal inputted into the RF signal; and a second mixer 824 for mixing the fixed local frequency signal generated from said second local oscillator and the IF signal and converting the mixed result into the RF signal having a constant center frequency of the multi-frequency assignment band.

In regarding to claim 10, Xin teaches an RF transmitting device 800 having a baseband signal on I/Q channels 801, 802 and a transmitting antenna, said RF transmitting device comprising: a digital modulators for performing a QPSK modulation (Column 11 Line 49 – 52 and Figure 8); a D/A converter 814 for converting the QPSK modulated signal into an analog signal and outputting the converted analog signal to an analog frequency up-converting unit (Figure 8); said analog frequency up-converting unit comprising a first frequency up-converter

818, 820 for converting the analog modulated signal outputted from said D/A converter into an arbitrary IF signal, a band-pass filter 822 for filtering the up-converted IF signal in said first frequency up-converter to an arbitrary bandwidth, and a second frequency up-converter 824, 826 for converting the filtered IF signal in said band-pass filter into an RF signal to thereby output the converted RF signal to a transmitting unit; and said transmitting unit for amplifying the up-converted RF signal in said second frequency up-converter of said analog frequency up-converting unit to an arbitrary transmitting output level and transmitting the amplified signal via said transmitting antenna (Column 11 Line 46 – 47). Xin, however, does not teach modulating baseband signals by each frequency assignment provide from the channel cards. Antonio teaches modulating baseband signals by each frequency assignment provide from the channel cards (Column 19 Line 35 – Column 20 Line 16, Figure 14C). It would have been obvious to one skilled in the art to modify Xin to include modulating baseband signals by each frequency assignment provide from the channel cards as taught by Antonio in order to increase the capacity of a cell in a CDMA system (Column 1 Line 42–50).

In regarding to claim 12, Xin teaches an RF transmitting device 800 of a mobile radio communication base station system in a CDMA system having a channel cards providing baseband signals on I/Q channels 801, 802 and a

transmitting antenna, said RF transmitting device comprising: a digital modulators for executing a QPSK modulation (Column 11 Line 49 – 52 and Figure 8); a D/A converter 814 for converting the QPSK modulated signal into an analog signal to thereby output the converted analog signal to an analog frequency up-converting unit (Figure 8); said analog frequency up-converting unit comprising a first frequency up-converter 818, 820 for up-converting the analog signal outputted from said D/A converter into an arbitrary IF signal, a band-pass filter 822 for band-pass filtering the IF signal outputted from said first frequency up-converter to an arbitrary bandwidth, and a second frequency up-converter 824, 826 for converting the IF signal filtered in said band-pass filter into an RF signal to thereby output the converted RF signal to a transmitting unit; and said transmitting unit for amplifying the up-converted RF signal in said second frequency up-converter of said analog frequency up-converting unit to an arbitrary transmitting output level and transmitting the amplified signal via said transmitting antenna (Column 11 Line 46 – 47). Xin, however, does not teach modulating baseband signals by each frequency assignment provide from the channel cards. Xin, also, does not teach the outputs of the modulators serially coupled. Antonio teaches modulating baseband signals by each frequency assignment provide from the channel cards (Column 19 Line 35 – Column 20 Line 16, Figure 14C). Antonio, also, teaches the

serially coupled outputs from the modulators outputted to the D/A converter (Figure 13). It would have been obvious to one skilled in the art to modify Xin to include modulating baseband signals by each frequency assignment provide from the channel cards as taught by Antonio in order to increase the capacity of a cell in a CDMA system (Column 1 Line 42–50).

In regarding to claim 14, Antonio teaches the serially coupled outputs from the modulators outputted to the D/A converter (Figure 13).

5. Claim 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Xin et al. in view of Antonio et al. and further in view of Chester et al. (U.S. Patent 5,930,301).

In regarding to claim 3, Xin in view of Antonio teaches the digital modulators comprises: the digital signal processing blocks 804, 810; a digital local oscillator for outputting arbitrary local frequencies having the phase difference of 90 (Column 11 Line 21 and 28); a plurality of mixers 806, 812 for mixing each of the local frequencies having the phase of 0 and 90 generated from said local oscillator and each of the baseband signals on the I/Q channels; and an adder 808 for adding the mixed signals on the I and Q channels in said plurality of mixers. Xin in view of Antonio, however, does not teach explicitly that the digital signal processing blocks are comprised of low-pass filters and interpolation filters.

Chester teaches the digital signal processing blocks comprised of low-pass filters 200 and interpolation filters 11. It would have been obvious to one skilled in the art to modify Xin in view of Antonio to include the low-pass filters and interpolation filters as taught by Chester in order to reduce distortion (Column 1 Line 47 -49).

In regarding to claim 4, Antonio teaches that 1.25 MHz is the preferred channel bandwidth in CDMA (Column 5 Line 25 – 28).

Allowable Subject Matter

6. Claim 8, 11 and 13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

(The examiner noticed that the specific value of 3.75MHz comes from the facts that there are three channels (application Figure 3) and each channel has bandwidth of 1.25MHz (claim 4). However, none of objected claims has the limitations on both the number of channels and channel bandwidth.)

Response to Arguments

7. Applicant's arguments with respect to claim 1–7, 9, 10, 12 and 14 have been considered but are moot in view of the new ground(s) of rejection.

Applicant argues that Xin and Boesel does not disclose structures to modulate baseband signals on I/Q channels by each frequency assignment provided from the channel card. Antonio teaches modulating baseband signals by each frequency assignment provide from the channel cards (Column 19 Line 35 – Column 20 Line 16, Figure 14C).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Clemence Han whose telephone number is (703) 305-0372. The examiner can normally be reached on Monday-Friday 8 to 5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu can be reached on (703) 308-6602. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

C. H.

Clemence Han
Examiner
Art Unit 2665

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SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600